Abstract


Long-term magnesium supplementation improves arterial stiffness in overweight and obese adults: results of a randomized, double-blind, placebo-controlled intervention trial.

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BACKGROUND: Epidemiologic studies have suggested a protective effect of magnesium intake on cardiovascular disease risk. However, intervention trials of magnesium supplementation on blood pressure and conventional cardiometabolic risk markers are inconsistent. Effects on vascular function markers related to cardiovascular disease risk have rarely been studied.

OBJECTIVE: The objective was to evaluate the effects of long-term magnesium supplementation on arterial stiffness.

DESIGN: We performed a 24-wk, randomized, double-blind, placebo-controlled intervention study. Fifty-two overweight and slightly obese individuals (30 men and 22 postmenopausal women, mean ± SD age: 62 ± 6 y) were randomly allocated to receive either 3 times daily magnesium (3 × 117 mg or 350 mg/d) or placebo capsules. Twenty-four-hour urine collections and 24-h ambulatory blood pressure assessments were performed at the start and end of the study. Carotid-to-femoral pulse wave velocity (PWVc-f) was assessed at baseline, after 12 wk, and at week 24.

RESULTS: Serum magnesium concentrations did not differ after 12 wk but tended to increase after 24-wk magnesium supplementation compared with placebo by 0.02 mmol/L (95% CI: 0.00, 0.04 mmol/L; P= 0.09). Twenty-four-hour urinary magnesium excretion increased by 2.01 mmol (95% CI: 1.22, 2.93 mmol; P< 0.001) at week 24. PWVc-f was not changed after 12 wk (0.0 m/s; 95% CI: -0.6, 0.5 m/s; P= 0.90) but was improved in the magnesium compared with the placebo group by 1.0 m/s (95% CI: 0.4, 1.6 m/s; P= 0.001) after 24 wk. Office and 24-h ambulatory blood pressure levels were not changed. No adverse events were observed.

CONCLUSION: Our data indicate that a daily magnesium supplement of 350 mg for 24 wk in overweight and obese adults reduces arterial stiffness, as estimated by a decrease in PWVc-f, suggesting a potential mechanism by which an increased dietary magnesium intake beneficially affects cardiovascular health. This trial was registered at clinicaltrials.gov as NCT02235805.

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